Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	
Expanding Flexible Use of the 3.7 GHz to 4.2 GHz Band	GN Docket No. 18-122
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band	RM-11791
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service	RM-11778

COMMENTS OF SPEEDCAST COMMUNICATIONS, INC.

Speedcast Communications, Inc. ("Speedcast") hereby responds to the Commission's requests for comments on whether to introduce new terrestrial mobile services in the 3.7-4.2 GHz band and, if so, how best to proceed.[1] The 3.7-4.2 GHz band is the downlink (space-to-Earth) or earth station-receive portion of the so-called "C-band" fixed-satellite service ("FSS") spectrum, which is already shared with certain terrestrial fixed point-to-point operations. In some situations, the C-band may be the only viable option for providing broadband services that support commercial operations and enhance safety and security of important facilities in the national interest.

Speedcast urges the Commission to protect C-band FSS from interference from terrestrial mobile services and to appropriately compensate earth station licensees for their costs of mitigating interference from the new services.

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[1] *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Order and Notice of Proposed Rulemaking, FCC 18-91 (rel. July 13, 2018). These comments will refer to the two portions of the Commission's action as the "Order" and "NPRM," respectively.

Background

Speedcast is the largest provider of remote communications services in the world. Speedcast's fully-managed services are delivered via a global network of 70+ satellites and an interconnecting global terrestrial network, bolstered by extensive on-the-ground local support from 40+ countries. This global "network of networks" provides customers with the most robust, integrated infrastructure available in the market for their mission critical applications.

Speedcast provides a variety of communications solutions to meet unique customer needs and enable business transformation. Speedcast extends its managed services through differentiated technology offerings including cyber-security, crew welfare, content solutions, data and voice applications, and network systems integration services. Speedcast serves more than 2,000 customers in more than 140 countries in sectors including Maritime, Energy, Mining, Enterprise, Media, Cruise, Nongovernmental Organizations ("NGOs"), and Government.

Speedcast supports many customers in the United States with C-band services that deliver important connectivity. For example, the C-Band is used to connect exploration and drilling rigs in the Gulf of Mexico and otherwise support energy sector participants using small C-band remote user terminals. Speedcast also supports the majority of the cruise industry, for which reliable and high capacity connectivity services are vital. Speedcast serves these customers using a combination of its own gateway teleports and by leasing capacity from third party teleports.

Discussion

A. The Commission Should Preserve and Protect Satellite-Based C-band Services

Market trends have continued to show growing demand for C-band satellite communications services. C-band earth station facilities play a critical role in distributing video content, connecting remote, rural and at-risk areas, and provide critical operational connectivity for off-shore oil platforms, commercial and passenger shipping, and other maritime sectors.

Earth stations facilitate communications links to remote areas that are otherwise difficult or impossible to serve with today's terrestrial communications infrastructure. Many of these services cannot be delivered via any terrestrial means and, in all cases, relocation of C-band earth station facilities – geographically or spectrally – would be costly and difficult.

Speedcast supports the Commission's efforts to protect incumbent C-band earth station licensees from harmful interference produced by the introduction of terrestrial mobile services in the band, a goal the Commission has acknowledged serves the public interest.[2] Without appropriate protections, reallocation of C-band downlink FSS spectrum would severely disrupt the operation of gateway teleports and end-user terminals alike.

C-band offers virtually ubiquitous global coverage, making it more broadly available than other alternatives. Modern satellites focus the energy of some beams, chiefly Ku- or Ka- bands, on specific routes or market locations, but global C-band beams remain to reach virtually all user terminals, wherever located, even when they are not within Ku- or Ka-band spot beams.

It is important to recognize that the Commission's actions in this proceeding will not only affect C-band FSS earth station operations in the United States. Those end-user terminals that must rely on C-band coverage in remote areas (*e.g.*, in Alaska or outside the United States) are supported by gateway earth stations in the United States that receive "return link" (remote-to-gateway) communications in the 3.7-4.2 GHz band. Restricting U.S. gateway receive operations in the 3.7-4.2 GHz band will thus have an adverse impact on the ability of C-band end-user terminals to transmit in the corresponding uplink band, regardless of their geographic location, because the uplink and downlink frequency pairs are generally hard-coded in C-band FSS satellites.

[2] NPRM at ¶¶ 27-28.

The C-band is far less susceptible to rain fade than other satellite services – Ku- and Ka-band do not offer the same protections, and poor weather will interrupt service to customers in those higher frequency bands, directly affecting operations and potentially shutting down oil supplies. The more robust C-band link is vital to meet the public safety and national interest needs of the energy industry, for example, which operate in areas of the Gulf of Mexico that regularly experience hurricanes and other strong tropical storms. When the weather is at its worst is also when reliable communications are most vital. In the world of FSS, that means reliance on C-band.

B. The Commission Should Limit Its Reallocation of C-Band Spectrum and the Associated Freeze

The mere protection of incumbent earth stations at their current locations is not sufficient to ensure the continued availability of C-band FSS everywhere it is critically needed.[3] At a minimum, the Commission should un-freeze and continue to accept applications to license or register new C-band FSS earth stations to be located outside the 48 contiguous United States. To ensure that these remote earth stations can operate, the Commission should also preserve sufficient spectrum for the associated C-band gateway operations throughout the nation.

In addition, the Commission should consider reallocating C-band FSS downlink spectrum for terrestrial mobile use only where there is demonstrated market demand for such spectrum, and only in such amounts as are necessary to meet that demand. In rural and remote areas, currently-allocated spectrum may be sufficient, or nearly so, to meet the needs of the market. Even in more densely populated areas, only a portion of the C-Band will be required.[4] To the

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[3] *E.g.*, NPRM at ¶ 27 (proposing criteria for defining protected incumbent earth stations), ¶ 29 (seeking comment on the relative obligations and/or rights that protected incumbents may have), ¶ 30 (proposing to permanently limit eligibility to file applications to modify or register C-band earth stations to incumbents at their registered locations, and bar applications to register or license new stations in new locations).

[4] *See, e.g., Ex Parte* Letter from Jennifer D. Hindin, GN Docket Nos. 17-183, 18-122 (filed Oct. 23, 2018), at Attachment (Press Release, "C-Band Alliance Increases to 200 MHz Its FCC Proposal for Spectrum Repurposing in the U.S. to Support Nationwide 5G Deployment," Oct. 22, 2018) ("*C-Band Alliance Press Release*").

extent the Commission introduces new terrestrial services in the C-band, it should correspondingly acknowledge the full costs and impact of that transition on C-band FSS service providers and their customers and provide compensation accordingly.

1. The Commission Should Exclude Points Outside of the 48 Contiguous United States from this Proceeding

Speedcast urges the Commission to limit its introduction of licenses for new terrestrial mobile services in this band to points within the 48 contiguous United States. By excluding Alaska, Hawaii, and offshore locations such as oil and gas platforms in the Gulf of Mexico from the transition, the Commission would help preserve that spectrum for continued use for C-band downlink operations. Given that FSS is often the only viable alternative to connect such remote points, it would strongly serve the public interest to maintain today's range of available FSS options, including the C-band. Furthermore, given the critical nature of the operational and other communications connectivity supported by Speedcast's C-band services, it would strongly *disserve* the public interest to disrupt communications in the 3.7-4.2 GHz band that are essential for operation of remote infrastructure with national security and economic importance.

The Commission should offer the benefits of license protection, not only to existing C-band receive operations, but to all C-band receive operations outside of the contiguous United States, regardless of when they come into operation.[5] The Commission should therefore immediately lift the freeze on applications to license or register new C-band earth stations at points outside the 48 contiguous states,[6] and continue to accept and grant such applications as it

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[5] *See, e.g.,* Press Release, "Eutelsat partners with Intelsat and SES in U.S. C-band Spectrum Proposal" (July 12, 2018) (proposing to cabin the transition to "C-band downlink frequencies in any part of the lower 48 United States"), *available at:* https://www.ses.com/press-release/eutelsat-partners-intelsat-and-ses-us-c-band-spectrum-proposal; *see also* Ex Parte Letter from Jennifer D. Hindin, GN Docket Nos. 17-183, 18-122 (filed Oct. 17, 2018), at Attachment A ("Exclusion of Alaska and Hawaii—no transfer of spectrum in these regions") ("*C-Band Alliance Commitment*").

[6] See Public Notice, "Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7-4.2 GHz Band, 90-Day Window to File Applications for Earth

has in the past, with full protection afforded to previous licensees. In most cases, such locations are unlikely to be targets of any widespread commercial deployment of mass market terrestrial mobile services in this band. Moreover, earth stations onboard vessels ("ESV") receive operations can be permitted in the entire 3.7-4.2 GHz band regardless of location.

2. The Commission Should Preserve Sufficient Spectrum for Continued Delivery of C-Band FSS and Allocate Spectrum to New Terrestrial Mobile Services Only Where Necessary to Meet Demonstrated Demand

To support critical C-band FSS operations, Speedcast urges the Commission to protect incumbent C-band operations within the United States. The Commission should thus find technical and other means to grandfather such operations that have enabled C-band satellite services to become a vital part of the U.S. telecommunications ecosystem.

Speedcast acknowledges that co-frequency sharing of the 3.7-4.2 GHz band between incumbent FSS and terrestrial mobile services in close geographic proximity raises challenges that, in some cases, may only be overcome through partitioning the band.[7] Partitioning the spectrum between FSS and terrestrial services is also challenging because high-power terrestrial base station transmissions can overwhelm the ability of the earth station to receive low-power satellite transmissions anywhere in the band. Nevertheless, earth station equipment modifications (albeit at significant cost and operational disruption, as discussed below) could facilitate the transition of a portion of the 3.7-4.2 GHz band to terrestrial mobile services, where additional spectrum is needed for that purpose.

Because the need for new 3.7-4.2 GHz spectrum will vary considerably based on population density, terrain topology, or other regional characteristics, the Commission should allocate at most a

Stations Currently Operating in the 3.7-4.2 GHz Band," DA 18-398 (rel. on April 19, 2018). The freeze has since been extended through October 31, 2018.

[7] NPRM at ¶ 51.

small portion of the band for new terrestrial mobile services, and only then in densely populated areas where there is demonstrated need for additional spectrum. Because remote and less densely populated regions of the United States may not require additional spectrum for new terrestrial mobile services, it is certainly possible that sufficient geographic separation will exist, at least in some areas, to enable C-band earth stations to continue to access the entire 3.7-4.2 GHz band on a protected basis under Commission licenses or registrations.

In more densely populated regions, the Commission should similarly minimize the adverse impact of potential reallocation decisions by preserving sufficient spectrum in the 3.7-4.2 GHz band to enable incumbent C-band FSS providers to continue meeting customer demand.[8] For remote terminals, which serve a site-specific customer communication need, spectrum at that site is of critical importance. Even for gateway operations, the high cost of interference mitigation or hub relocation, for which operators should be fully compensated, militate strongly in favor of approaches that preserve incumbent operations at current sites to the greatest extent possible.

Only after the needs of existing FSS services are met should the Commission consider opening some or all of the remaining 3.7-4.2 GHz spectrum to more intensive terrestrial use, and only where there is demonstrated market demand. Proceedings around the world suggest that reallocation of only a limited portion of this spectrum would meet the anticipated needs of the terrestrial mobile market in this band.[9] In contrast, an auction or other process that reallocates a

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[8] *C-Band Alliance Commitment* at Attachment A (pledging "[c]ontinued access to C-band for your services at a comparable Quality of Service for so long as we are licensed to provide C-band services in the continental U.S.").

[9] *See, e.g.,* EC Decision 2014/276/EU, "Commission Implementing Decision of 2 May 2014 on amending Decision 2008/411/EC on the harmonisation of the 3400 - 3800 MHz frequency band for terrestrial systems capable of providing electronic communications services in the Community, OJ L 139/18 (14 May 2014), at 20 (European Commission decision implementing expanded terrestrial mobile use of the 3.4-3.8 GHz band); Ofcom, *Statement on Improving Consumer Access to Mobile Services at 3.6 GHz to 3.8 GHz* (rel. Oct. 26, 2017) (*available at:* https://www.ofcom.org.uk/__data/assets/pdf_file/0019/107371/Consumer-access-3.6-3.8-GHz.pdf) (reallocating 3.6-3.8 GHz spectrum to terrestrial mobile use); Danish Energy Agency, "Consultation for the 1.5 GHz, 3.5 GHz and 26 GHz Frequency Bands," J. No. 2018-15059 (issued July 11, 2018) (available at: https://ens.dk/service/hoeringer/hoering-over-interessen-frekvenser-i-frekvensbaandene-35-ghz-26-ghz-og-15-ghz)

substantial portion of this spectrum for terrestrial use everywhere in the nation would not maximize the public interest benefits to be gained,[10] as it would disrupt existing FSS services in areas where no need yet exists for additional spectrum resources to meet terrestrial needs.

Within the portion of the spectrum preserved for C-band FSS use, the Commission's "full-band, full-arc" policy will significantly aid in maximizing efficient spectrum usage. Availability of the full visible portion of the GSO arc at any given location promotes frequency re-use in accord with the Commission's two-degree spacing rules, maximizing the number of C-band satellites available to a customer to obtain service and creating flexibility and enhancing competition. If the Commission in fact reduces the amount of C-band spectrum available for FSS use, it will require C-band customers to pack more closely into the remaining portion of the band, heightening the importance of such flexibility.

C. Earth Station Licensees/Value-Added Resellers Should Receive Fair Compensation for the Impact of the Commission's Actions

Gateway facilities are typically large installations with multiple, large satellite transmit and receive antennae, which require a highly trained and specialized workforce to install, operate and maintain. Sites are chosen after extensive analysis of the spectrum environment and careful coordination with other licensees. Environmental protection, historical preservation, zoning, permitting, land use, and other planning processes are lengthy and costly to complete.

Introduction of new terrestrial mobile users in close proximity to existing C-band gateways (or user terminals) will impose significant costs on the earth station licensees. Terrestrial wireless base or mobile station transmissions are far stronger when they reach the

(examining 3.4-3.8 GHz band for terrestrial mobile use); Singapore Infocomm Media Development Authority, Consultation Paper, "5G Mobile Services and Networks (rel. May 23, 2017) (*available at:* https://www.imda.gov.sg/-/media/imda/files/inner/pcdg/consultations/consultation-paper/public-consultation-on-5g-mobile-services-and-networks/5g-public-consultation.pdf) (examining 3.4-3.6 GHz band for terrestrial mobile use).

[10] NPRM at ¶¶ 98-110.

earth station than those from a distant satellite, meaning than they can saturate the low noise block downconverter ("LNB"), preventing the earth station from receiving C-band signals anywhere in the band.[11] There are no currently available filters that completely and reliably suppress the unwanted signals while allowing the desired signals to pass, meaning that, in many cases, the LNB itself must be replaced with one that is insensitive to the frequencies used by terrestrial mobile base stations.

If the Commission were to adopt rules that produce a more serious impact, severely limiting the amount of C-band spectrum available for FSS use, it could be necessary to relocate an entire teleport. In Speedcast's experience, the costs of dismantling, shipping, reinstalling large gateway earth stations, together with the necessary siting, zoning, real estate, and personnel costs of doing so, could easily impose costs reaching well into the six figures or more.

As it has done in the past, the Commission should ensure that incumbent C-band licensees do not bear the brunt of these costs. Rather, as the Commission has proposed,[12] it should provide a mechanism to compensate incumbent licensees for their costs of accommodating new terrestrial services that create harmful interference to their licensed operations. For example, when the Commission reorganized the 800 MHz band to accommodate the communications needs of public safety first-responders and other emergency services, it established a Transition Administrator to oversee the distribution of funds for service reconfiguration and spectrum relocation costs incurred by incumbents.[13] More recently, the Commission used this principle to shape its

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[11] NPRM at ¶ 173.

[12] NPRM at ¶¶ 66 *et seq.*

[13] *See, e.g., Improving Public Safety Communications in the 800 MHz Band*, WT Docket No. 02-55, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, FCC 04-168, 19 FCC Rcd 14969 (2004), at ¶¶ 177-178 ("Under the band reconfiguration plan, the principal cost component will be borne by Nextel, which will pay for all channel changes necessary to implement the reconfiguration. Nextel is obligated to ensure that relocated licensees receive at least comparable facilities when they change channels.").

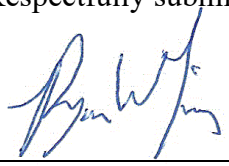
Broadcast Incentive Auction and auction proceeds are being used both to compensate broadcasters and multichannel video programming distributors ("MVPDs").[14]

To the extent that the Commission authorizes a market facilitator to manage such a transition of C-band spectrum, it should ensure that any economic surplus that is generated, beyond compensation for costs of mitigating the effects on incumbent earth station operations, are appropriately shared among all parties, including earth station licensees.

Conclusion

Speedcast urges the Commission to protect incumbent C-band operations from interference from reallocation of the 3.7 to 4.2 GHz band, and requests that the Commission proceed with any expansion of terrestrial mobile use of the band in a way that preserves connectivity options for C-band FSS customers. The Commission should also ensure the earth station licensees are appropriately compensated for their costs of mitigating interference from the new services.

Respectfully submitted,



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[14] *See generally Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, FCC 14-50, 29 FCC Rcd 6567 (2014), at ¶¶ 25-26 (forward and reverse auctions), ¶ 35 (procedures to reimburse costs reasonably incurred by television stations that are reassigned to new channels in the repacking process, as well as by MVPDs to continue to carry such stations); *Post-Incentive Auction Transition*, MB Docket No. 16-306, Public Notice, "Incentive Auction Closing and Channel Reassignment Public Notice," DA 17-314, 32 FCC Rcd 2786 (2017), at ¶ 2 (describing proceeds from the forward auction that exceeded the costs identified in the reverse auction, permitting reimbursement of displaced broadcasters and MVPDs with additional funds available to reduce the Federal deficit).